



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Northwest Region  
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Seattle, WA 98115

Refer to:  
2002/01446

January 9, 2003

Mr. Gary L. Larson  
Forest Supervisor  
U.S. Forest Service  
Mt. Hood National Forest  
16400 Champion Way  
Sandy, OR 97055-7248

Re: Endangered Species Act Emergency Formal Section 7 Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on Fire Suppression Activities for the Bowl Fire, Mt. Hood National Forest, Middle Clackamas River, Clackamas River Ranger District, Clackamas County, Oregon.

Dear Mr. Larson:

Enclosed is a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the fire suppression activities associated with the Bowl Fire. NOAA Fisheries concludes in this Opinion that the emergency action is not likely to jeopardize Lower Columbia River (LCR) steelhead (*Onchorynchus mykiss*) or Upper Willamette River (UWR) chinook salmon (*O. tshawytscha*). As required by section 7 of the ESA, NOAA Fisheries provided a list of initial recommendations to Mt. Hood National Forest fisheries personnel to minimize impacts to listed fish species during the fire suppression activities associated with the Bowl Fire. With the exception of one fire retardant drop, those recommendations were successfully carried out.

This Opinion also serves as consultation on essential fish habitat for coho salmon (*O. kisutch*) and chinook salmon pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600.

Please direct any questions regarding this consultation to Ron Lindland of my staff in the Oregon Habitat Branch at 503.231.2315.

Sincerely,

D. Robert Lohn  
Regional Administrator

cc: Brad Goehring, USFWS  
Dan Shively, MHNF



Endangered Species Act - Section 7 Consultation  
Biological Opinion  
&  
Magnuson-Stevens Act  
Essential Fish Habitat Consultation


Biological Opinion

Emergency Consultation on Effects of Fire Suppression for the Bowl Fire,  
Middle Clackamas River, Clackamas River Ranger District,  
Mt. Hood National Forest, Clackamas County, Oregon

Agency: U.S. Forest Service

Consultation  
Conducted By: NOAA Fisheries,  
Northwest Region

Date Issued: January 9, 2003

Issued By:   
D. Robert Lohn  
Regional Administrator

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## 1. ENDANGERED SPECIES ACT

### 1.1 Background

On December 11, 2002, the National Marine Fisheries Service (NOAA Fisheries) received a letter and accompanying biological assessment (BA) from the Mt. Hood National Forest (MHNH) requesting completion of emergency formal consultation regarding the effects of the fire suppression activities associated with the Bowl Fire along the Clackamas River on listed Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*) and Upper Willamette River (UWR) chinook salmon (*O. tshawytscha*), and conferencing on Lower Columbia River/Southwest Washington (LCRSW) coho salmon (*O. kisutch*), a candidate for listing under the Endangered Species Act (ESA). In the BA, the MHNH determined that the emergency action had “likely adversely affected” (LAA) LCR steelhead and UWR chinook salmon. The MHNH also determined that the activities were LAA LCRSW coho salmon. The Bowl Fire started in the early afternoon of Saturday, September 21, 2002, along the south side of the Clackamas River (T5S, R6E, sections 1 and 6). The fire was human-caused but of undetermined origin. Because fire suppression activities would likely result in incidental take of listed salmonids, the MHNH initiated emergency consultation procedures with NOAA Fisheries on Monday, September 23, 2002.

The fire burned through 339 acres of forest land dominated by old growth Douglas-fir and western hemlock, and burned mostly understory vegetation. Most of the old growth trees within the riparian reserves along the Clackamas River remain intact. According to the BA, the burn severity of the fire has been estimated as low on 239 acres, moderate on 70 acres, and high on 30 acres. The fire’s northern perimeter extended along approximately 2.5 miles of the mainstem Clackamas River between River Miles (RM) 41.5 and 44.0. The severe burn areas occurred in small patches totaling 30 acres along the steep hillside; where patches ranged in distance from 30 to 500 feet from the river. There are 1.5 miles of intermittent non-fish-bearing streams located within the fire perimeter. These intermittent streams were not flowing any water at the time of the fire. The area burned by the fire is characterized by very steep, rocky terrain with numerous rock outcrops and shallow soils.

On September 23 and 24, 2002, NOAA Fisheries provided recommendations, through telephone conversations and faxes to MHNH fisheries personnel in order to minimize incidental take resulting from the fire suppression activities associated with the Bowl Fire. On October 2, 2002, Bob Bergamini, fishery biologist in the Clackamas River Ranger District, called to provide a brief summary of the fire suppression and restoration activities associated with the Bowl Fire, and to report that the fire had been fully contained on September 28, 2002.

LCR steelhead were listed as threatened under the Endangered Species Act (ESA) by NOAA Fisheries on March 19, 1998 (63 FR 13347). UWR chinook salmon were listed as threatened on March 24, 1999 (64 FR 14308). NOAA Fisheries issued protective regulations for LCR steelhead and UWR chinook salmon under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). LCRSW coho salmon are currently a candidate for listing under the ESA (60 FR 38011;

July 25, 1995). Since consultation is not required for candidate species, LCRSW coho salmon will not be further addressed under the ESA portion of this Opinion. Coho salmon are addressed in the essential fish habitat (EFH) section of this Opinion. NOAA Fisheries expects that the effects of fire suppression activities associated with the Bowl Fire on LCRSW coho salmon and their habitat would be the same as those on LCR steelhead and UWR chinook salmon.

The objective of this Opinion is to determine whether the subject emergency action jeopardized the continued existence of LCR steelhead or UWR chinook salmon

## **1.2 Emergency Action**

The emergency action was the implementation of fire suppression activities associated with the Bowl Fire. Fire suppression efforts included the use of air operations (fixed wing aircraft and helicopter) and ground support. Over a four-day period, fixed wing aircraft were used to dump 30 loads (74,058 gallons) of fire retardant (Fire-Trol LCG-R, Liquid Concentrate) on the fire. Helicopters were used to drop 494,680 gallons of water on the fire over a six-day period. Helicopter bucket dipping occurred from deep pools at three sites in the Clackamas River, upstream and downstream from the fire. Water to fill tanker trucks was pumped from Fish Creek (a large Clackamas River tributary) at one location, and from the Clackamas River along the east and west flanks of the fire in two locations. Intake screens with pore size of 1/8th to 1/4th inch were used on all pumps. Water from the tanker trucks was then unloaded into fold-a-tanks, which served as water sources along the south perimeter of the fire.

During one fire retardant drop at approximately 4:30 p.m. on September 21, 2002, an estimated 100 to 200 gallons of retardant entered the Clackamas River. According to the BA, the strong east winds which were blowing at the time of the drop caused the retardant to drift into the river. None of the other fire retardant drops occurred within 300 feet of the river. On September 23 and 24, 2002, fish biologists from the Clackamas River Ranger District and the Oregon Department of Fish and Wildlife (ODFW) checked along the river for approximately one mile downstream from the retardant drop site and found no evidence of any direct adverse effects to fish or other aquatic life.

### Fireline Construction.

Approximately 5,000 feet of hand-constructed fire line was built to control the Bowl Fire. About 2,000 feet were built along the east perimeter of the fire, and about 3,000 feet along the west perimeter.

Approximately 5,580 feet of fire line was constructed using a bulldozer along the slope break at the south end of the fire. This fire line was located on flat terrain, and did not cross any streams. A 0.75 acre safety zone was constructed along the west flank of the fire where the dozer line and hand-constructed line met. Another safety zone was established on the flat area to the south of Forest Road 5410-120.

### Base Camp.

An incident command post and base camp was established in the Estacada Timber Park. The Timber Park is located along Wade Creek. LCR steelhead and coho salmon occur in Wade Creek. However, the base camp facilities were located over 300 feet from Wade Creek, and had no effect on these species or their habitat.

### Helicopter Landing Sites.

The helibase used during the Bowl Fire was at Beaver Oaks Airport; a private airstrip located approximately 1.5 miles north of Estacada. All needed helicopter support and refueling took place at this site. The helibase is located more than one mile from any water source.

### Roads and Road Maintenance.

Roads used during fire suppression activities on the Bowl Fire included Highway 224 and Forest Roads 5410 (paved), 5410-120 (aggregate surface), 5410-013 (aggregate surface), and 5410-014 (aggregate surface). Highway 224, the main access route up the Clackamas River, is a paved road and was used mainly for administrative and public use.

Forest roads 5410 and 5410-120 were the main roads used during fire suppression efforts. These roads provided access for crews and equipment to the south side of the fire. Road 5410-120 was bladed and brushed with some additional clearing to prepare the road as an indirect fire control line. Water was used on the 5410-120 road for dust abatement during the initial suppression efforts. Two level one roads were re-opened during the suppression activities (5410-013 and 5410-014). A portion of the 5410-013 road was used for a control line and provided access to the south end of the fire perimeter. The 5410-014 road was opened to provide access to a safety zone along the south end of the fire. Both the 5410-013 and 5410-014 roads were closed to vehicular traffic following completion of fire suppression activities.

### Fire Mop-up Operations.

Mop-up of the Bowl Fire was accomplished utilizing both helicopter water drops and crews using both hand tools and water. Water was from pumped from either fold-a-tanks supplied by tanker trucks or by pumps set up along the Clackamas River.

According to the BA, the following mop-up standards were established for the Bowl Fire:

1. 100% mop-up within 300 feet of the fire perimeter on the east, west, and south flanks of the fire where it was safe to do so.
2. Mop-up of the lower (north) flank consisted of helicopter water drops as needed.
3. Bucking of logs was minimized to prevent rolling material.
4. Burning trees/snags within the interior were allowed to burn out.
5. In general, the interior of the fire was allowed to burn out naturally.

### Rehabilitation.

Rehabilitation consisted of bringing any area disturbed by suppression activities back to pre-fire conditions. According to the BA, the following rehabilitation tasks have been completed:

1. Pickup and remove all flagging, garbage, litter, and equipment from firelines, parking areas, drop points, and safety zones.
2. Pull back all side cast materials, slash, and logs removed from safety zones and parking areas. Break up any compacted areas. Distribute materials across areas and re-contour area to original contours if needed.
3. Construct water bars on all hand and bulldozer constructed fire lines where needed to reduce erosion.
4. Pull slash back into all roads opened by the fire suppression effort (Forest Roads 5410-013 and 5410-014). Camouflage/naturalize the first 100 feet of these roads with down limbs and brush to discourage use of these roads by vehicular traffic.
5. Pull and disperse berms back across firelines. Pull brush, limbs, and logs back onto fire lines in areas where the line is secure to help disperse water.
6. Camouflage/naturalize the first 300 feet of bulldozer and hand-constructed firelines off all road systems
7. Remove all debris left from brushing Road 5410-120 from the ditch line and scatter along the opposite side of the road.
8. Blade and re-grade Road 5410-120 and return road to pre-suppression level two standards.
9. Seed and mulch all bulldozer- constructed firelines. Seed and mulch designated areas at 75 pounds per acre of seed (native blue wild rye) and 3000 pounds per acre of mulch (annual ryegrass straw grown in the Willamette Valley). Safety zones will not be seeded and will be allowed to regenerate naturally.

### **1.3 Biological Information**

The listing status and biological information for LCR steelhead are described in Busby *et al.* (1996) and NMFS (1997). Listing status and biological information for UWR chinook salmon is provided in Myers *et al.* (1998).

The Clackamas River provides spawning, rearing, and migratory habitat for both adult and juvenile life stages of LCR steelhead and UWR chinook salmon. Listed fish species present in the Clackamas River at the time of the fire suppression effort for the Bowl Fire included adult and juvenile UWR chinook salmon and juvenile LCR steelhead. Juvenile LCR steelhead and/or UWR chinook salmon may have been rearing in Fish Creek. UWR chinook salmon were spawning in the Clackamas River at the time of the fire. Several chinook salmon redds were present in the vicinity of the fire perimeter approximately 200 yards downstream from the east (upstream) edge of the fire.

Essential features of the adult spawning, juvenile rearing, and adult and juvenile migratory habitats for the species are substrate, water quality, water quantity, water temperature, water

velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. The essential features that the proposed project may affect are safe passage conditions, substrate, water quality, and riparian vegetation resulting from project activities.

## **1.4 Evaluating Proposed Actions**

The standards for determining jeopardy and destruction or adverse modification of critical habitat are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations combined with the Habitat Approach (NMFS 1999): (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species and whether the action is consistent with the available recovery strategy; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors is likely to appreciably reduce the likelihood of species survival in the wild or destroy or adversely modify critical habitat. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species or result in the destruction or adverse modification of critical habitat. If either or both are found, NOAA Fisheries will identify reasonable and prudent alternatives for the action that avoid jeopardy or destruction or adverse modification of critical habitat.

### **1.4.1 Biological Requirements**

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with information considered in its decision to list LCR steelhead and UWR chinook salmon for ESA protection then considers new data available that are relevant to the determination.

The relevant biological requirements are those necessary for LCR steelhead and UWR chinook salmon to survive and recover to naturally-reproducing population levels at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, spawning and rearing. LCR steelhead and UWR chinook salmon survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function,

while removing adverse impacts of current practices. In conducting analyses of habitat-altering actions, NOAA Fisheries defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and applies a “habitat approach” to its analysis (NMFS 1999). The current status of the LCR steelhead and UWR chinook salmon, based upon their risk of extinction, has not significantly improved since the species were listed.

#### **1.4.2 Environmental Baseline**

In step 2 of NOAA Fisheries’ analysis, we evaluate the relevance of the environmental baseline in the action area to the species’ current status. The environmental baseline is an analysis of the effects of past and ongoing human-caused and natural factors leading to the current status of the species or its habitat and ecosystem within the action area. The action area includes, “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR 402.02). The action area for this consultation, therefore, includes the area within the perimeter of the Bowl Fire, the streambed and streambanks of the mainstem Clackamas from the upstream edge of the fire perimeter to the downstream edge of the fire perimeter, and the immediate vicinity of the helicopter bucket dip sites in the Clackamas River and the pump chance sites on Fish Creek and the Clackamas River.

The current population status and trends for LCR steelhead are described in Busby *et al.* (1996) and in NMFS (1997). Listing status and biological information for UWR chinook salmon is provided in Myers *et al.* (1998). In general, the current status of LCR steelhead and UWR chinook salmon populations is the result of several long-term, human-induced factors (*e.g.*, habitat degradation, water diversions, hydropower dams) that serve to exacerbate the adverse effects of natural environmental variability from such factors as drought, floods, and poor ocean conditions.

Environmental baseline conditions within the action area were evaluated for the subject action at the project level and watershed scales. This evaluation was based on the “matrix of pathways and indicators (MPI) described in “Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale” (NMFS 1996). This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

In the Middle Clackamas River 5<sup>th</sup> field watershed, nine of the 18 habitat indicators in the MPI were rated as properly functioning. These are: Sediment, chemical contamination/nutrients, physical barriers, substrate, pool quality, width/depth ratio, streambank condition, peak/base flows, and disturbance history. Seven of the 18 indicators were rated as functioning “at risk.” These are: Water temperature, large woody debris, off-channel habitat, refugia, floodplain connectivity, road density and location, and riparian reserves. Pool frequency and drainage network increase were rated as not properly functioning. The environmental baseline conditions for each habitat indicator in the MPI are described in the BA and incorporated herein by reference.

## 1.5 Analysis of Effects

In step 3 of the jeopardy analysis, NOAA Fisheries evaluates the effects of the emergency action on listed salmon and steelhead.

### 1.5.1 Effects of Emergency Action

#### Fire Retardant Drift into the Mainstem Clackamas River.

According to the BA, long-term retardants, mixed for application on fire, contain about 85% water, 10% fertilizer, and 5% minor ingredients. These minor ingredients consist of color (iron oxide), thickener (natural gum and clay), corrosion inhibitors, stabilizers, and bactericides. The major ingredient (fertilizer) is ammonium phosphate, a commonly used agricultural fertilizer, consist of ammonia and phosphate or sulfate ions. The corrosion inhibitors contain sodium ferrocyanide, which can release free cyanide during the decomposition process of the retardant. Studies show that a single retardant drop directly into a stream may cause a sufficient ammonia concentration in the water to be lethal to fish and other aquatic organisms. The effects will change depending on the volume of retardant that actually enter the water, the size of the body of water, and the volume of flow in the stream or river.

The accidental drift of approximately 100 to 200 gallons of fire retardant into the mainstem Clackamas River may have resulted in incidental take of UWR chinook salmon and/or LCR steelhead. However, checks by Clackamas River Ranger District and ODFW fishery biologists after the retardant entered the river found no dead fish, thereby indicating that lethal take probably did not occur. During the survey, fishery biologists did observe both young-of-the-year fish and crayfish along the river margins downstream from the drop site. Several UWR chinook salmon redds were located approximately 0.3 to 0.5 mile downstream from the point where the retardant entered the river.

The retardant drop was not concentrated directly into the river, but rather drifted with the wind. In addition, the flow volume of the Clackamas River in the vicinity of the retardant drop was approximately 840 cubic feet per second (more than 376,000 gallons per minute) at the time of the drop. This flow estimate is based on the U. S. Geological Survey (USGS) Three Lynx gauge reading at RM 47.8 (3.8 miles upstream from the upstream edge of the fire) of 770 cubic feet per second (cfs) plus an estimate for tributaries entering between the gauge and the retardant drop site. Because the retardant entered the river as a result of drift and because of the flow volume of the river which would result in rapid dilution of the retardant, direct effects of the retardant on listed fish would be reduced. A water quality monitoring station located at Carter Bridge approximately 1.4 miles downstream of the retardant drop site, showed no evidence of any abnormal changes to water chemistry or turbidity. This station takes readings every 15 minutes.

The fire retardant used on the Bowl Fire was Fire-Trol LCG-R. Gaikowski (1996) conducted laboratory tests on the acute toxicity of Fire-Trol LCG-R and four other commonly used fire control chemicals on five life stages (eyed egg, embryo-larvae, swim-up fry, 60-day old juvenile, and 90-day old juvenile) of rainbow trout (*O. mykiss*). Of the five chemicals tested, Fire-Trol

LCG-R was the least toxic to rainbow trout. The 96-hour median lethal concentration (LC50) for Fire-Trol LCG-R ranged from 872 milligrams per liter (mg/L) for swim-up fry to over 10,000 mg/L for eyed eggs. The 96-hour LC50 for 60-day old juveniles was 1,413 mg/L. LCR steelhead fry in the Clackamas River drainage emerge from the gravel by late June or early July. Therefore, juvenile LCR steelhead which may have been present in the Clackamas River at the time of the retardant spill would have been at least 60 days old.

Because the fire retardant drifted into the river rather than being dropped directly into the river, and because the retardant only entered along one side of the river rather than being spread across the entire river, it is difficult to estimate what concentration of Fire-Trol LCG-R may have been present in the Clackamas River at the site of the spill and downstream. Gaikowski (1996) stated that Fire-Trol LCG-R would have to be diluted at least 297 to 310-fold to reach a concentration equal to the 96-hour LC50 for swim-up fry (the most sensitive life stage). Based on the flow of the Clackamas River at the point where the retardant entered the river (more than 376,000 gallons per minute) and assuming that approximately 200 gallons of retardant entered the river and that it may have been mixed across approximately one third the width of the river (125,440 gallons per minute), the retardant would have been diluted approximately 627-fold (125,440/200), a concentration less than half the 96-hour LC-50 for rainbow trout fry. In addition, the initial concentration at the spill site would be expected to decrease rapidly because of mixing with the river water.

Effects of the fire retardant on UWR chinook salmon eggs in the redds located between 0.3 to 0.5 mile downstream from the point where the retardant entered the river would be expected to be minimal. As mentioned above, the amount of flow in the Clackamas River would have resulted in rapid dilution of the retardant. Gaikowski (1996) found that eyed eggs of rainbow trout were the least sensitive to Fire-Trol LCG-R of the five life stages tested, with a 96-hour LC50 of over 10,000 mg/L.

#### Helicopter Bucket Dipping and Pumping of Water.

Helicopter bucket dipping of water from the mainstem Clackamas River may have resulted in incidental take of UWR chinook salmon and/or LCR steelhead. Juvenile UWR chinook and/or LCR steelhead could be dipped from the river in the helicopter buckets and killed when the water is dumped on the fire. The water was dipped from open water, mid-river areas of large, deep pools in the mainstem Clackamas River. Juvenile salmonids which may have been rearing in these pools would most likely be associated with instream structure (*e.g.* boulders, logs) which would be avoided by the helicopter. In addition, juvenile salmonids which happened to be near the dip area at the time the helicopter bucket entered the water would most likely avoid the bucket by swimming away. Therefore, NOAA Fisheries believes that any lethal incidental take of listed salmonids resulting from dipping of water from the mainstem Clackamas River in helicopter buckets was minimal.

Pumping of water from the river and from Fish Creek may have resulted in incidental take of juvenile LCR steelhead and/or UWR chinook salmon. No modification of the one pump chance location on Fish Creek or the sites on the Clackamas River were necessary. Spill cloths were

used at all sites where pumps were in use. Intake screen with a pore size of 1/8th to 1/4th inch were used on all pumps. Because pump intakes were properly screened and because no modification to pump chance sites was necessary, it is likely that no lethal incidental take occurred as a result of water pumping activities.

#### Fireline Construction and Rehabilitation.

Approximately 5,000 feet of hand-constructed fireline and 5,581 feet of bulldozer-constructed firelines were constructed as part of the Bowl Fire suppression. All Clackamas River tributary streams within the perimeter of the fire are intermittent, non-fishbearing streams and were not flowing any water at the time of the fire. The bulldozer-constructed fireline was located on flat terrain at a slope break along the south edge of the fire. The hand-constructed lines were in steep, rocky terrain along the east and west flanks of the fire. None of these firelines crossed any streams. All bulldozer-constructed firelines have been mulched and seeded and water-bars have been constructed on all hand-constructed and bulldozer constructed fire-lines where appropriate. Because the firelines did not cross any streams, streams within the fire perimeter are intermittent, and firelines have been rehabilitated, any potential for sediment transport to listed salmonid habitat in the Clackamas River is expected to be minimal.

#### Roads.

The two level-one roads that were re-opened during the suppression activities (5410-013 and 5410-014) have been closed. Slash has been pulled back onto the roads and the first 100 feet of each road has been camouflaged/naturalized with downed limbs and brush to discourage use by vehicular traffic. The 5410-120 has been re-bladed and returned to pre-suppression standards. Because these are ridgetop roads in the area of the Bowl Fire, any potential impacts to aquatic habitat is expected to be minimal.

#### Other Activities.

The base camp for the Bowl Fire was established in the Estacada Timber Park, and was located more than 300 feet from Wade Creek. The helibase at Beaver Oaks Airport is located more than one mile from any water source. Activities associated with these bases had no effect on listed fish or their habitat.

### **1.5.2 Cumulative Effects**

Cumulative effects are defined in 50 CFR 402.02 as “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.” This is step 4 in NOAA Fisheries’ analysis process. All land within the action area is administered by the MHN. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being, have been, or will be reviewed through separate section 7 consultation processes. Therefore, these actions are not considered cumulative to this emergency action.

## **1.6 Conclusion**

The final step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action is likely to appreciably reduce the likelihood of species survival or recovery in the wild. NOAA Fisheries has determined that, when the effects of the emergency fire suppression activities associated with the Bowl Fire addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of LCR steelhead or UWR chinook salmon. NOAA Fisheries believes that the drift of fire retardant into the Clackamas River, helicopter bucket dipping of water from the Clackamas River, and pumping of water from Fish Creek and the Clackamas River are likely to have resulted in some incidental take of juvenile LCR steelhead and/or UWR chinook salmon. However, the level of potential mortality would be expected to be minimal and would not result in jeopardy.

These conclusions are based on the following considerations: (1) The amount of flow (840 cfs or more than 376,000 gallons per minute) in the Clackamas River at the point where the fire retardant entered the river and the fact that the fire retardant drifted with the wind rather than being dropped directly into the river would be expected to result in rapid dilution of the fire retardant; (2) helicopter bucket dipping of water from the Clackamas River occurred from open water, mid-river areas of large, deep pools in the river away from instream structure and stream margins where juvenile salmonids would most likely be rearing; (3) juvenile salmonids which happened to be near a dip area at the time the helicopter bucket entered the water would most likely avoid the bucket by swimming away; (4) intakes of pumps used to pump water from Fish Creek and the Clackamas River were properly screened with 1/8th to 1/4 inch screen; (5) hand-constructed and bulldozer-constructed fire-lines did not cross any streams and tributary streams within the fire perimeter were not flowing at the time of the fire; and (6) rehabilitation activities have been completed on firelines, roads, parking areas, drop zones, and safety zones.

## **1.7 Conservation Recommendations**

Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. NOAA Fisheries has no additional conservation recommendations regarding the action addressed in this Opinion.

## **2. INCIDENTAL TAKE STATEMENT**

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by

significantly impairing behavioral patterns such as breeding, feeding, and sheltering. “Harass” is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. “Incidental take” is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of the incidental take statement.

## **2.1 Amount or Extent of the Take**

NOAA Fisheries anticipates that the emergency action is reasonably certain to have resulted in incidental take of LCR steelhead and/or UWR chinook salmon because of detrimental effects from drift of fire retardant into the Clackamas River (non-lethal and lethal), helicopter bucket dipping of water from the Clackamas River (non-lethal and lethal), pumping of water from Fish Creek and the Clackamas River (non-lethal and lethal).

Effects of actions such as these are unquantifiable in the short term and are not expected to be measurable as long-term harm to habitat features or by long-term harm to salmonid behavior or population levels. Therefore, even though NOAA Fisheries expects some low level incidental take occurred due to the emergency actions covered by this Opinion, best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate the specific amount of incidental take to the species itself. In instances such as these, NOAA Fisheries designates the expected level of take as "unquantifiable." Based on the information in the biological assessment, NOAA Fisheries anticipates that an unquantifiable amount of incidental take could occur as a result of the emergency actions covered by the Opinion. The extent of the take includes the aquatic and associated riparian habitats affected by emergency fire suppression activities associated with the Bowl Fire.

Unlike general habitat effects, the effects of the fire suppression activities could result in minor incidental lethal take of juvenile LCR steelhead and/or UWR chinook salmon. The incidental lethal take could be caused by the effects of fire retardant in the immediate vicinity where it entered the Clackamas River, entrapment in the helicopter bucket and being dropped on the fire along with the water, entrainment on a pump intake screen, or delayed mortality.

## **2.2 Effect of the Take**

In this Opinion, NOAA Fisheries has determined that the level of anticipated take is not likely to result in jeopardy to LCR steelhead or UWR chinook salmon when the reasonable and prudent measures are implemented.

## **2.3 Recommendations Provided to Minimize Take**

On September 24, 2002, NOAA Fisheries faxed a list of initial recommendations to minimize impacts to listed fish species during fire suppression activities to the Clackamas Ranger District. These recommendation included a summary of emergency consultation procedures as well as the following general recommendations:

1. Minimize the felling of snags.
2. Leave any felled trees or snags in the largest pieces feasible.
3. Re-close roads opened to access the fire (to prior condition as a minimum)
4. Place fire lines and other suppression activities along ridgelines, where possible, rather than mid-slope or in riparian areas.
5. Try to keep retardant-contaminated helicopter buckets and other equipment out of and away from streams and rivers as much as possible. This may involve rinsing clean the contaminated equipment prior to use in open water.
6. Minimize disturbance of riparian and aquatic habitat. Work outside of riparian and aquatic habitats to the maximum extent possible.
7. Minimize use of heavy equipment, such as a bulldozer, in riparian/aquatic habitat.
8. Minimize felling and bucking of trees within riparian/aquatic habitat.
9. Locate camps and equipment servicing/storage areas outside riparian/aquatic habitat.
10. Refuel equipment away from streams (recommend at least 150 feet from water bodies) and place pumps and other machinery on pads or protect adjacent streams from chemical contamination to the maximum extent possible.
11. Obtain water for fire suppression from as large a body of water as possible to minimize effects on fish which may be present.
12. When pumping water from streams, ensure that at least one-half the original stream flow volume remains below the pump site.
13. Where fry-sized salmonids may be present, screen mesh openings shall not exceed 3/32 inch (2.38mm) for woven wire or perforated plate screens, or 0.0689 inch (1.75 mm) for profile wire screens, with a minimum 27% open area. If fry-sized salmonids are not present at the site (by determination of agency biologists) screen mesh openings shall not exceed 1/4 inch (6.35 mm) for woven wire, perforated plate screens, or profile wire screens, with a minimum of 40% open area.
14. Where possible, helicopter landing sites and refueling areas will be located outside of Riparian Reserves. Hazardous fuel containment systems will be used where repeated use of refueling sites occurs in Riparian Reserves.

An additional document faxed to the MHNH by NOAA Fisheries listed guidelines for aerial delivery of retardant or foam near waterways. One of those guidelines was to avoid aerial application of retardant or foam within 300 feet of waterways. The document also provided guidance for pilots for three types of aircraft which might be used to drop retardant (medium/heavy airtankers, single engine airtankers, and helicopters).

## **2.4 Success in Implementing Recommendations**

With the exception of one fire retardant drop at approximately 4:30 p.m. on September 21, 2002, which drifted into the Clackamas River, NOAA Fisheries believes that all of the recommendations and guidelines provided to the MHNH by NOAA Fisheries to minimize impacts to listed salmonids or their habitat during fire suppression activities associated with the Bowl Fire were successfully implemented. The potential effects of that fire retardant drop and other fire suppression activities associated with the Bowl Fire on LCR steelhead and UWR chinook salmon are discussed in section 1.5.1 above.

## **3. MAGNUSON-STEVENSON ACT**

### **3.1 Background**

The objective of the essential fish habitat (EFH) consultation is to determine whether the emergency actions may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

### **3.2 Magnuson-Stevens Fishery Conservation and Management Act**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: “Waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

### **3.3 Identification of EFH**

The Pacific Fisheries Management Council (PFMC) has designated EFH for Federally-managed fisheries within the waters of Washington, Oregon, and California. Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999).

Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*O. tshawytscha*), coho (*O. kisutch*), and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

### **3.4 Emergency Action**

The emergency action is detailed above in section 1.2. The action area for this consultation includes the area within the perimeter of the Bowl Fire; the streambed and streambanks of the

mainstem Clackamas from the upstream edge of the fire perimeter to the downstream edge of the fire perimeter; and, the immediate vicinity of the helicopter bucket dip sites in the Clackamas River and the pump chance sites on Fish Creek and the Clackamas River. This area has been designated as EFH for coho salmon and chinook salmon.

### **3.5 Effects of Emergency Action**

Coho salmon and UWR chinook salmon spawn, rear, or migrate in the mainstem Clackamas River both upstream and downstream from the Bowl Fire site. Information submitted by the MHNf in its request for consultation is sufficient for NOAA Fisheries to conclude that the effects of the emergency action are transient, local, and of low intensity. NOAA Fisheries also believes that the conservation measures proposed as an integral part of the action would avoid, minimize, or otherwise offset potential adverse impacts to designated EFH for coho salmon and chinook salmon.

### **3.6 Conclusion**

NOAA Fisheries believes that fire suppression activities associated with the Bowl Fire may have temporarily adversely affected designated EFH for coho salmon and chinook salmon.

### **3.7 EFH Conservation Recommendations**

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures that the MHNf has built into the emergency action to suppress the Bowl Fire are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

### **3.8 Statutory Response Requirement**

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

### **3.9 Supplemental Consultation**

The MHNf must reinitiate EFH consultation with NOAA Fisheries if either the action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

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